

Appl. No.: 10/657,775
Amdt. dated 12/06/2005
Reply to Office action of 10/05/2005

REMARKS/ARGUMENTS

In the Office Action dated October 5, 2005, Claims 1-65 are pending, of which Claims 1-46 have been elected for prosecution. The remaining Claims 47-65 are cancelled above. Claims 24-27, 30-32, 35, 37, 38, 41-44, and 46 are rejected under 35 U.S.C. § 102(b) as being anticipated by WO 01/83182 A1 to Weihs, et al. Claims 24, 26, 29, 33, 34, 37, 39-42, and 46 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,967,402 to Kuwabara. Claims 1-3, 6, 12, 14, 16, 17, 24-29, 37, 39, and 40 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,308,882 to Shuster, et al. Claims 8, 9, 33, and 34 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shuster, et al. in view of U.S. Patent No. 5,855,965 to Molerus, et al., and Claims 8, 21, 33, and 34 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shuster, et al. in view of U.S. Publication No. 2004/0265503 to Clayton, et al. Claims 4-7, 10, 11, 13, 15, 18-20, 22, 23, 36, and 45 are indicated to be allowable if rewritten in independent form.

Claim 1 is amended above to include a feature previously set forth in Claim 4, which was indicated to be allowable. In particular, Claim 1 as amended, which is directed to a method of forming a weld joint using a sealant and an exothermic reaction, recites "friction stir welding the at least one structural member by rotating a friction stir welding pin and urging the pin through the interface to form a joint between the first and second faying surfaces, the joint being at least partially sealed by the sealant." Applicant respectfully submits that Claim 1 as amended is allowable for the same reasons as previous Claim 4, i.e., the cited references do not teach the claimed feature of friction stir welding with a rotating friction stir welding pin. Accordingly, Claims 2-23, which depend from Claim 1, should also be allowable for the same reasons. Dependent Claim 4 is amended above to further recite that the friction stir welding pin extends from a shoulder, which is urged against the at least one structural member so that the pin is urged through the interface to friction stir weld the at least one structural member.

Similarly, independent Claim 24 is amended above to include a feature previously set forth in Claim 36 (and intervening Claim 35). Claim 36 was indicated to be allowable, and Applicant therefore submits that Claim 24 is allowable as amended.

New Claim 66 is directed to a method similar to previous Claim 24 but also incorporates the features of dependent Claim 27 (i.e., that the structural members are welded at the interface

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to form a weld joint) and further recites that "said initiating step is performed at a time that is non-concurrent with said welding step." Dependent Claim 27 was rejected as being anticipated by Weihs, et al. and Shuster, et al.; however, Applicant respectfully submits that Claim 66 as currently amended, is allowable over the cited references as described below.

Claim 66 recites the steps of disposing a sealant in an interface of at least one structural member, initiating an exothermic reaction in the sealant to at least partially seal the interface, and welding the structural member at the interface to form a weld joint between the first and second faying surfaces of the structural members, the weld joint being at least partially sealed by the sealant. Further, the claim recites that "said initiating step is performed at a time that is non-concurrent with said welding step." In other words, the exothermic reaction can be initiated separately (i.e., at a different time) from the formation of the weld joint. For example, as described in the present application, the sealant 40 can be reacted before welding of the structural members 20, 22, e.g., by using an oven, flame, laser, or the like to heat all or part of the sealant 40 and/or the structural members 20, 22 to an initiation temperature of the sealant 40 at which the exothermic reaction begins to take place. In fact, the reaction of the sealant 40 can result in the formation of a joint that holds the structural members 20, 22 in place while the subsequent welding operation is performed. See page 8, lines 13-21; page 9, lines 16-32. Alternatively, the sealant 40 can be reacted after the welding has ended, e.g., by disposing the sealant 40 on the faying surfaces 24, 26 of the structural members 20, 22, positioning the faying surfaces 24, 26 in an opposed configuration to form the interface 28 therebetween, friction welding the members 20, 22 to form a friction weld joint 12, and subsequently reacting the sealant 40 to form the seal in the interface 28. See page 10, lines 8-15.

Weihs, et al., on the other hand, is directed to a reactive multilayer foil that provides a heat source for joining members. Weihs, et al. specifically states that such internal heat sources are used "[t]o alleviate the problems associated with external heat sources." Page 2, lines 16-17. For example, according to Weihs, et al., a method that requires the heating of an entire unit to be bonded to a temperature high enough to melt the bond material "presents problems because the bulk materials to be joined are often delicate or sensitive to the high temperatures required in the process. These high temperatures may damage the materials to be bonded." Page 2, lines 7-15. Weihs, et al. does not teach or suggest a method in which materials are welded to form a weld

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joint. Further, even if the bond formed by the reaction of the multilayer foil of Weihs, et al. is considered to be a weld joint, that joint is formed concurrently with the exothermic reaction of the foil. In other words, the formation of the joint and the reaction of the foil are the same operation. Weihs, et al. does not teach or suggest a method in which an exothermic reaction is performed and a separate welding operation is also performed, the exothermic reaction being at a time that is non-concurrent with the welding operation.

Shuster, et al. is directed to a method for joining ductile iron and steel components by depositing a metallic material between the two components and welding the components. *See, e.g., Abstract.* Shuster, et al. does not teach or suggest initiating an exothermic reaction at a time other than during the welding operation.

Accordingly, Applicant respectfully submits that Claim 66 is allowable over the cited references, as are each of the new dependent Claims 67-84, which include features previously set forth in the other dependent claims. Further, the dependent claims provide additional bases of distinction over the cited references. For example, Claim 76 specifically recites that the step of initiating the exothermic reaction in the sealant to seal the interface "is performed prior to said welding step." Claim 77 recites that the "initiating step is performed subsequent to said welding step." As discussed above, the cited references do not teach or suggest the claimed timing of the initiating and welding steps.

For the foregoing reasons, Applicant respectfully submits that all of the pending Claims 1-34, 37-46, and 66-84 are allowable.

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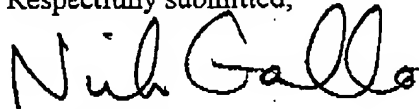
CONCLUSIONS

In view of the remarks presented above, Applicant submits that the present application is in condition for allowance. As such, the issuance of a Notice of Allowance is therefore respectfully requested. In order to expedite the examination of the present application, the Examiner is encouraged to contact Applicant's undersigned attorney in order to resolve any remaining issues.

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It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

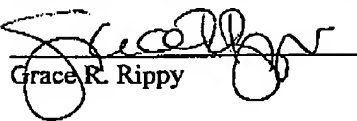


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Grace R. Rippey

December 9, 2005
Date